

10/522513

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Organization  
International Bureau



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5 February 2004 (05.02.2004)

PCT

(10) International Publication Number  
**WO 2004/011651 A1**

(51) International Patent Classification<sup>7</sup>: C12N 15/50, (74) Agent: MILES, John, S.; Eric Potter Clarkson, Park View  
C07K 14/165, G01N 33/50, C12Q 1/68, C12N 7/00 House, 58 The Ropewalk, Nottingham NG1 5DD, United Kingdom (GB).

(21) International Application Number:  
PCT/GB2003/002832

(22) International Filing Date: 1 July 2003 (01.07.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
0217434.0 27 July 2002 (27.07.2002) GB

(71) Applicant (for all designated States except US): THE ROYAL VETERINARY COLLEGE [GB/GB]; University of London, Royal College Street, London NW1 0TU (GB).

(72) Inventors; and

(75) Inventors/Applicants (for US only): BROWNLIE, John [GB/GB]; Royal veterinary college, Hawkshead Lane, North Mymms, Hartfield, Herts AL9 7TA (GB). CHALKER, Victoria, Jane [GB/GB]; Royal veterinary college, Hawkshead Lane, North Mymms, Hartfield, Herts AL9 7TA (GB). ERLES, Kerstin [DE/GB]; Royal veterinary college, Hawkshead Lane, North Mymms, Hartfield, Herts AL9 7TA (GB).

(81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— with international search report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: CANINE RESPIRATORY CORONAVIRUS (CRCV) SPIKE PROTEIN, POLYMERASE AND HEMAGGLUTININ/ESTERASE

ctcagatcaa tttgaaatat gctatttagtg ctaagaatag agcccgact gttgctggtg 60  
tttccatact tagtactatg actggcagaa tgtttcatca aaaatgtttg aaaagtatag 120  
cagctacacg tgggtttcct gttgttatag gcaccactaa attttatggc ggctggatg 180  
atatgttacg tcgccttatt aaagatgttg acaatcctgt acttatgggt tgggattatc 240  
ctaagtgtga 250

(57) Abstract: A canine respiratory coronavirus (CRCV) that is present in the respiratory tract of dogs with canine infectious respiratory disease and which has a low level of homology to the enteric canine coronavirus, but which has a high level of homology to all bovine coronavirus strains (eg Quebec and LY138) and human coronavirus strain OC43. The CRCV spike, polymerase and hemagglutinin/esterase cDNA and protein partial sequences are listed in Figures (1) to (4), (13) and (14).

WO 2004/011651 A1

**INTERNATIONAL SEARCH REPORT**

Internal	Application No
PCT/	03/02832

A. CLASSIFICATION OF SUBJECT MATTER	IPC 7 C12N15/50	C07K14/165	G01N33/50	C12Q1/68	C12N7/00
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According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 C07K C12N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the International search (name of data base and, where practical, search terms used)

EPO-Internal, BIOSIS, Sequence Search, WPI Data

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p>STEPHENSEN, C.B., CASEBOLT, D.B.,  GANGOPADHYAY, N.N.: "Phylogenetic  analysis of a highly conserved region of  the polymerase gene from 11 coronaviruses  and development of a consensus polymerase  chain reaction assay"  VIRUS RESEARCH, AMSTERDAM, NL,  vol. 60, no. 2, April 1999 (1999-04),  pages 181-189, XP002242737  ISSN: 0168-1702  cited in the application  the whole document</p> <p style="text-align: center;">-/-</p>	1-10, 24, 30, 31

Further documents are listed in the continuation of box C.

Patent family members are listed in annex.

\* Special categories of cited documents :

- \*A\* document defining the general state of the art which is not considered to be of particular relevance
- \*E\* earlier document but published on or after the International filing date
- \*L\* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- \*O\* document referring to an oral disclosure, use, exhibition or other means
- \*P\* document published prior to the International filing date but later than the priority date claimed

- \*T\* later document published after the International filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- \*X\* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- \*Y\* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- \*&\* document member of the same patent family

Date of the actual completion of the International search	Date of mailing of the International search report
20 October 2003	27/10/2003
Name and mailing address of the ISA  European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Authorized officer  Chambonnet, F.

**INTERNATIONAL SEARCH REPORT**

Internal	Application No
PCT/GB 03/02832	

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	"STUDIES OF RESPIRATORY DISEASE IN RANDOM SOURCE LABORATORY DOGS VIRAL INFECTIONS IN UNCONDITIONED DOGS" BINN L N---; ALFORD J P; MARCHWICKI R H; KEEFE T J; BEATTIE R J; WALL H G, vol. 29, no. 1, 1979, pages 48-52, XP0008023128 cited in the application the whole document	
A	WO 93 23423 A (SMITHKLINE BEECHAM CORP ; JONES ELAINE V (US); KLEPFER SHARON (US); MI) 25 November 1993 (1993-11-25) the whole document	1-87
X	US 5 672 350 A (BABIUUK LORNE A ET AL) 30 September 1997 (1997-09-30) the whole document	47-54
A	WO 99 25838 A (CONTRERAS ANAPATRICIA ; BROWN THOMAS P (US); UNIV GEORGIA (US); VILLEG) 27 May 1999 (1999-05-27) claims 8-12	1
A	US 6 057 436 A (KLEPFER SHARON ET AL) 2 May 2000 (2000-05-02) the whole document	1
A	EP 0 510 773 A (AKZO NV) 28 October 1992 (1992-10-28) the whole document	1
X	US 5 916 570 A (KAPIL SANJAY) 29 June 1999 (1999-06-29) the whole document	47-54
A	HASOKSUZ M ET AL: "ANTIGENIC VARIATION AMONG BOVINE ENTERIC CORONAVIRUSES (BECV) AND BOVINE RESPIRATORY CORONAVIRUSES (BRCV) DETECTED USING MONOCLONAL ANTIBODIES" ARCHIVES OF VIROLOGY, NEW YORK, NY, US, vol. 144, no. 12, 1999, pages 2441-2447, XP001005398 ISSN: 0304-8608 the whole document	18-46
P,X	ERLES KERSTIN ET AL: "Detection of a group 2 coronavirus in dogs with canine infectious respiratory disease." VIROLOGY, vol. 310, no. 2, 5 June 2003 (2003-06-05), pages 216-223, XP002257085 ISSN: 0042-6822 the whole document	1-7

## INTERNATIONAL SEARCH REPORT

Intel  
nal application No.  
PCT/GB 03/02832

### Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1.  Claims Nos.: because they relate to subject matter not required to be searched by this Authority, namely:  
see FURTHER INFORMATION sheet PCT/ISA/210
2.  Claims Nos.: because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically.
3.  Claims Nos.: because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

### Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this International application, as follows:

1.  As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2.  As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3.  As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4.  No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

#### Remark on Protest

- The additional search fees were accompanied by the applicant's protest.  
 No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box I.1

Although claims 66 to 69 and 79 to 82 are directed to a method of treatment of the animal body, the search could be carried out and based on the alleged effects of the compound/composition.

Although claims 24 to 36, claims 67 to 69 and 87 are directed to a diagnostic method comprising steps practised on the animal body, the search has been carried out and based on the alleged effects of the compound/composition.

The applicant's attention is drawn to the fact that claims relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure. If the application proceeds into the regional phase before the EPO, the applicant is reminded that a search may be carried out during examination before the EPO (see EPO Guideline C-VI, 8.5), should the problems which led to the Article 17(2) declaration be overcome.

**INTERNATIONAL SEARCH REPORT**

Information on patent family members

Internal Application No
PCT/GB 03/02832

Patent document cited in search report	Publication date		Patent family member(s)	Publication date
WO 9323423	A 25-11-1993		AT 225805 T AU 670092 B2 AU 4251593 A CA 2135200 A1 DE 69332375 D1 DE 69332375 T2 DK 640098 T3 EP 0640098 A1 ES 2182827 T3 JP 3245169 B2 JP 7508421 T PT 640098 T WO 9323423 A1 US 6057436 A US 6372224 B1 US 2002127245 A1	15-10-2002 04-07-1996 13-12-1993 25-11-1993 14-11-2002 13-02-2003 28-10-2002 01-03-1995 16-03-2003 07-01-2002 21-09-1995 31-01-2003 25-11-1993 02-05-2000 16-04-2002 12-09-2002
US 5672350	A 30-09-1997		CA 2065365 A1 WO 9102752 A1 DE 69013512 D1 DE 69013512 T2 EP 0489033 A1 US 5369026 A	23-02-1991 07-03-1991 24-11-1994 23-02-1995 10-06-1992 29-11-1994
WO 9925838	A 27-05-1999		AU 1408499 A WO 9925838 A1	07-06-1999 27-05-1999
US 6057436	A 02-05-2000		US 2002127245 A1 AT 225805 T AU 670092 B2 AU 4251593 A CA 2135200 A1 DE 69332375 D1 DE 69332375 T2 DK 640098 T3 EP 0640098 A1 ES 2182827 T3 JP 3245169 B2 JP 7508421 T PT 640098 T WO 9323423 A1 US 6372224 B1 AU 666298 B2 AU 9128691 A CA 2096010 A1 EP 0557455 A1 IE 913948 A1 JP 6502768 T JP 2003093078 A KR 204258 B1 NZ 240558 A WO 9208487 A1 US 6280974 B1 US 2002115064 A1 ZA 9108988 A	12-09-2002 15-10-2002 04-07-1996 13-12-1993 25-11-1993 14-11-2002 13-02-2003 28-10-2002 01-03-1995 16-03-2003 07-01-2002 21-09-1995 31-01-2003 25-11-1993 16-04-2002 08-02-1996 11-06-1992 17-05-1992 01-09-1993 20-05-1992 31-03-1994 02-04-2003 15-06-1999 25-11-1994 29-05-1992 28-08-2001 22-08-2002 30-12-1992
EP 0510773	A 28-10-1992		AU 645417 B2 AU 1513192 A	13-01-1994 29-10-1992

**INTERNATIONAL SEARCH REPORT**

Information on patent family members

Internal Ref.	Application No
	PCT/GB 03/02832

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 0510773	A	CA 2066940 A1 EP 0510773 A1 JP 3420258 B2 JP 5260976 A NZ 242471 A US 5661006 A	26-10-1992 28-10-1992 23-06-2003 12-10-1993 26-05-1993 26-08-1997
US 5916570	A 29-06-1999	AU 705186 B2 AU 6383296 A CA 2224309 A1 EP 0833903 A1 WO 9641874 A1	20-05-1999 09-01-1997 27-12-1996 08-04-1998 27-12-1996

## PATENT COOPERATION TREATY

From the INTERNATIONAL SEARCHING AUTHORITY

PCT

NOTIFICATION OF TRANSMITTAL OF  
THE INTERNATIONAL SEARCH REPORT  
OR THE DECLARATION

(PCT Rule 44.1)

To:  
 ERIC POTTER & CLARKSON  
 Attn. Miles, John S.  
 Park View House  
 58 The Ropewalk  
 Nottingham NG1 5DD  
 UNITED KINGDOM

RECORDS	SEARCHED
27 OCT 2003	
PARTNER ISM	ACTIONED
↓	

Applicant's or agent's file reference  RVCW/P28428PC	Date of mailing (day/month/year)  27/10/2003
International application No.  PCT/GB 03/02832	FOR FURTHER ACTION      See paragraphs 1 and 4 below  International filing date (day/month/year)  01/07/2003
Applicant  ROYAL VETERINARY COLLEGE	

1.  The applicant is hereby notified that the International Search Report has been established and is transmitted herewith.

**Filing of amendments and statement under Article 19:**

The applicant is entitled, if he so wishes, to amend the claims of the International Application (see Rule 46):

**When?** The time limit for filing such amendments is normally 2 months from the date of transmittal of the International Search Report; however, for more details, see the notes on the accompanying sheet.

**Where?** Directly to the International Bureau of WIPO  
 34, chemin des Colombettes  
 1211 Geneva 20, Switzerland  
 Facsimile No.: (41-22) 740.14.35

For more detailed instructions, see the notes on the accompanying sheet.

2.  The applicant is hereby notified that no International Search Report will be established and that the declaration under Article 17(2)(a) to that effect is transmitted herewith.

3.  With regard to the protest against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:

the protest together with the decision thereon has been transmitted to the International Bureau together with the applicant's request to forward the texts of both the protest and the decision thereon to the designated Offices.

no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.

4. **Further action(s):** The applicant is reminded of the following:

Shortly after 18 months from the priority date, the international application will be published by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau as provided in Rules 90bis.1 and 90bis.3, respectively, before the completion of the technical preparations for international publication.

Within 19 months from the priority date, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase until 30 months from the priority date (in some Offices even later).

Within 20 months from the priority date, the applicant must perform the prescribed acts for entry into the national phase before all designated Offices which have not been elected in the demand or in a later election within 19 months from the priority date or could not be elected because they are not bound by Chapter II.

Name and mailing address of the International Searching Authority

European Patent Office, P.B. 5818 Patentlaan 2  
 NL-2280 HV Rijswijk  
 Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,  
 Fax: (+31-70) 340-3016

Authorized officer

Geertruida Groeneveld-Van der Spek

## PATENT COOPERATION TREATY

## PCT

## INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference  RVCW/P28428PC	<b>FOR FURTHER ACTION</b>	see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.
International application No.  PCT/GB 03/02832	International filing date (day/month/year)  01/07/2003	(Earliest) Priority Date (day/month/year)  27/07/2002
Applicant  ROYAL VETERINARY COLLEGE		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 5 sheets.

It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

- a. With regard to the language, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
  - the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).
- b. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international search was carried out on the basis of the sequence listing :
  - contained in the international application in written form.
  - filed together with the international application in computer readable form.
  - furnished subsequently to this Authority in written form.
  - furnished subsequently to this Authority in computer readable form.
  - the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
  - the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2.  Certain claims were found unsearchable (See Box I).

3.  Unity of invention is lacking (see Box II).

4. With regard to the title,

- the text is approved as submitted by the applicant.
- the text has been established by this Authority to read as follows:

CANINE RESPIRATORY CORONAVIRUS (CRCV) SPIKE PROTEIN, POLYMERASE AND HEMAGGLUTININ/ESTERASE

5. With regard to the abstract,

- the text is approved as submitted by the applicant.
- the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the drawings to be published with the abstract is Figure No.

- as suggested by the applicant.
- because the applicant failed to suggest a figure.
- because this figure better characterizes the invention.

1

None of the figures.

**INTERNATIONAL SEARCH REPORT**International application No.  
PCT/GB 03/02832**Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)**

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1.  Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:  
see FURTHER INFORMATION sheet PCT/ISA/210
2.  Claims Nos.:  
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3.  Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

**Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)**

This International Searching Authority found multiple inventions in this international application, as follows:

1.  As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2.  As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3.  As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4.  No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

**Remark on Protest**

- The additional search fees were accompanied by the applicant's protest.
- No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/SA/ 210

Continuation of Box I.1

Although claims 66 to 69 and 79 to 82 are directed to a method of treatment of the animal body, the search could be carried out and based on the alleged effects of the compound/composition.

Although claims 24 to 36, claims 67 to 69 and 87 are directed to a diagnostic method comprising steps practised on the animal body, the search has been carried out and based on the alleged effects of the compound/composition.

The applicant's attention is drawn to the fact that claims relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure. If the application proceeds into the regional phase before the EPO, the applicant is reminded that a search may be carried out during examination before the EPO (see EPO Guideline C-VI, 8.5), should the problems which led to the Article 17(2) declaration be overcome.

## INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/[REDACTED]03/02832

Patent document cited in search report		Publication date		Patent family member(s)	Publication date
WO 9323423	A	25-11-1993		AT 225805 T AU 670092 B2 AU 4251593 A CA 2135200 A1 DE 69332375 D1 DE 69332375 T2 DK 640098 T3 EP 0640098 A1 ES 2182827 T3 JP 3245169 B2 JP 7508421 T PT 640098 T WO 9323423 A1 US 6057436 A US 6372224 B1 US 2002127245 A1	15-10-2002 04-07-1996 13-12-1993 25-11-1993 14-11-2002 13-02-2003 28-10-2002 01-03-1995 16-03-2003 07-01-2002 21-09-1995 31-01-2003 25-11-1993 02-05-2000 16-04-2002 12-09-2002
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EP 0510773	A	28-10-1992		AU 645417 B2 AU 1513192 A	13-01-1994 29-10-1992

## INTERNATIONAL SEARCH REPORT

International Application No

PCT/00/03/02832

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	"STUDIES OF RESPIRATORY DISEASE IN RANDOM SOURCE LABORATORY DOGS VIRAL INFECTIONS IN UNCONDITIONED DOGS" BINN L N---; ALFORD J P; MARCHWICKI R H; KEEFE T J; BEATTIE R J; WALL H G, vol. 29, no. 1, 1979, pages 48-52, XP0008023128 cited in the application the whole document -----	
A	WO 93 23423 A (SMITHKLINE BEECHAM CORP ; JONES ELAINE V (US); KLEPFER SHARON (US); MI) 25 November 1993 (1993-11-25) the whole document -----	1-87
X	US 5 672 350 A (BABIUUK LORNE A ET AL) 30 September 1997 (1997-09-30) the whole document -----	47-54
A	WO 99 25838 A (CONTRERAS ANAPATRICIA ; BROWN THOMAS P (US); UNIV GEORGIA (US); VILLEGI) 27 May 1999 (1999-05-27) claims 8-12 -----	1
A	US 6 057 436 A (KLEPFER SHARON ET AL) 2 May 2000 (2000-05-02) the whole document -----	1
A	EP 0 510 773 A (AKZO NV) 28 October 1992 (1992-10-28) the whole document -----	1
X	US 5 916 570 A (KAPIL SANJAY) 29 June 1999 (1999-06-29) the whole document -----	47-54
A	HASOKSUZ M ET AL: "ANTIGENIC VARIATION AMONG BOVINE ENTERIC CORONAVIRUSES (BECV) AND BOVINE RESPIRATORY CORONAVIRUSES (BRCV) DETECTED USING MONOCLONAL ANTIBODIES" ARCHIVES OF VIROLOGY, NEW YORK, NY, US, vol. 144, no. 12, 1999, pages 2441-2447, XP001005398 ISSN: 0304-8608 the whole document -----	18-46
P, X	ERLES KERSTIN ET AL: "Detection of a group 2 coronavirus in dogs with canine infectious respiratory disease." VIROLOGY, vol. 310, no. 2, 5 June 2003 (2003-06-05), pages 216-223, XP002257085 ISSN: 0042-6822 the whole document -----	1-7

## INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/00/03/02832

Patent document cited in search report	Publication date		Patent family member(s)		Publication date
EP 0510773	A		CA 2066940 A1 EP 0510773 A1 JP 3420258 B2 JP 5260976 A NZ 242471 A US 5661006 A		26-10-1992 28-10-1992 23-06-2003 12-10-1993 26-05-1993 26-08-1997
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## INTERNATIONAL SEARCH REPORT

International Application No

PCT/ [REDACTED] 02832

## A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 C12N15/50 C07K14/165 G01N33/50 C12Q1/68 C12N7/00

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 C07K C12N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, BIOSIS, Sequence Search, WPI Data

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p>STEPHENSEN, C.B., CASEBOLT, D.B., GANGOPADHYAY, N.N.: "Phylogenetic analysis of a highly conserved region of the polymerase gene from 11 coronaviruses and development of a consensus polymerase chain reaction assay" VIRUS RESEARCH, AMSTERDAM, NL, vol. 60, no. 2, April 1999 (1999-04), pages 181-189, XP002242737 ISSN: 0168-1702 cited in the application the whole document</p> <p>-----</p> <p>-/-</p>	1-10, 24, 30, 31

 Further documents are listed in the continuation of box C. Patent family members are listed in annex.

## \* Special categories of cited documents:

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Date of the actual completion of the international search

20 October 2003

Date of mailing of the international search report

27/10/2003

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